BUSINESS CYCLES CREATION: SOME HISTORICAL AND THEORETICAL PERSPECTIVES

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ABSTRACT

Historically, generalization about economic fluctuations in an economic system over extended periods of time has proved to be difficult. Yet, it has been even more difficult to generalize across economic systems. In a historical setting, there are many theories offered to explain the creation of business cycles. In this study it is argued that the business cycle is not caused by a single factor but by a multiplicity of factors, therefore, such competing theories constitute special cases of the business cycle. This study maintains that there are families of business cycles, with each family representing a related set of economic systems. Given a family approach to economic systems, then it is conceivable that a general theory can be developed for each family of economic systems by grouping factors identifiable with particular sets of economic systems. Data from the United Nations for 137 countries were used to establish a classification scheme for families of economic systems. US time series data were examined to assess the plausibility of the general theory for one family of economic systems as advanced in this study.

INTRODUCTION

Historically, business cycles are defined as fluctuations in income, output and employment. In most studies on business cycles (sometimes referred to as economic cycles), authors are divided on the causes of those cycles. Some authors focus on a singular cause or on the inability to generalize on the cause of the business cycles. The singular cause identified differs among the "singular cause" theorists from a monetary shock to the multiplier principle or the accelerator principle. Given this lack of consensus, Gordon [1986, 3] maintains that economists are confronted with "the difficulty of developing a single theory that encompasses major features of business cycles."

Hicks [1950, 2] maintained that: (1) cycles are not uniform; (2) while they do share a family likeness, they differ considerably among themselves; and (3) their common characteristics are difficult to identify. Hicks' [1950,1-2] comment on the inability to generalize was due to the fact that statistical theorists had warned that "purely random sequences of events ... have a definite tendency to build up into cyclical patterns." This position of the statistical theorists is quite interesting, given the "mathematical theory of chaos" today [Goodwin 1989, 115-138].

ECONOMIC SYSTEMS AND CYCLE FACTORS

Economic systems are dynamic systems which differ in operating philosophies and institutional frameworks. The differing operating philosophies and institutional settings do produce different institutional effects on economic systems [Mullins and Wadhwani 1989]. Furthermore, each economic system is not the same over an extended period of time, since there are many structural and operating changes taking place over time. This position is not of recent origin; a similar view has been advanced by Hamberg [1951, 361]. It comes as no surprise that there have been changes in the U.S. economy [Gordon 1969]. Clear evidence on changes between 1914 and 1982 in the financial structure of the U.S. economy has been presented by Friedman [1986]. These changes make the system less vulnerable to some instability factors, while making it susceptible to new instability factors. Owing to these conditions, a generalization of economic fluctuations is rendered difficult. The position of Zarnowitz and Moore [1986, 572] reflects the current thinking on business cycles:

> ".. [V]arious structural, institutional, and policy changes contributed to the evolution of the business cycles. The process is continuing. There have been important changes, yet the most basic characteristics ... of the business cycles remain the same ..."

The difficulty with generalizing about business fluctuations in an economic system for an extended period is different from the difficulty with generalizing across economic systems which are encompassed within three hierarchical layers: (1) closed, partially open, and open economies; (2) fully developed, developing, and less developed economies; and (3) capitalist, socialist, mixed, and Japanese styled economies. The term "Japanese styled" economies is used because that type of economy is driven by a visible hand (The Ministry of International Trade and Industry), as opposed to the invisible hand of the capitalist economies. South Korea and Taiwan are to be considered as "Japanese styled" economies [Johnson 1982, Chap. one; 27,628,631-635]. Also to be considered in the family of this type of economic system are Malaysia and Singapore.

The various economic styles reflect different operating philosophies. For instance, the inventory adjustment effect on capitalist economies will be much more severe than on a Japanese styled economy, because in the latter manufacturing inventory is held to the

economic minimum. Another example is that of chronic over-production at one time and under-production at another time. This condition, which is witnessed in capitalist economies due to a lack of production coordination among business firms, will not appear in socialist economies with coordinated production [Lange 1938, 105-106]. However, socialist economies invariably experience underproduction [Nuti 1989, 430]. In addition, Fairise and Langot [1994, 1592] have concluded that given the finding by Danthine and Donaldson (1991) that the US labor market does not share the same features with the European markets then the US model of the business cycle is insufficient to explain the European business cycle. Accordingly, differing circumstances with each set representing forces of resistance and sources of vulnerability are accountable for the many special cases of the business cycle. Therefore, the business cycle cannot be attributed to a single factor but to a multiplicity of factors.

In spite of the foregoing diversity, it is conceivable that a general theory can be developed by grouping diverse factors associated with the business cycle and identifying each group of factors with particular economic systems. Based upon the information in Tables 1 and 2, there are thirty-six possible economic systems. If cycle factors related to each specific family can be identified, then generalization is possible.

TABLE 1

MATRIX OF STRUCTURAL TYPES OF ECONOMIC SYSTEMS

Industrialized	Structural Type			Countries Classified
Highly	O-1	P-1	C-1	16
Moderately	O-2	P-2	C-2	103
Less	O-3	P-3	C-3	18
# of Countries				137

(O = Open; P = Partially Open; C = Closed)

The classification for Table 1 is as follows:

Open Economy - Imports or exports are, on the average, greater than 70% of GDP for the Years 1972-1986.

Partially Open Economy - Imports and Exports are, on the average, between 15% and 70% of GDP for the Years 1972-1986.

Closed Economy - Imports and exports are, on the average, less than 15% of GDP for the Years 1972-1986.

TABLE 2

MATRIX OF PHILOSPOHICAL TYPES OF ECONOMIC SYSTEMS

	----------**Philosophical Types**----------			
Factors	**Capitalist**	**Socialist**	**Mixed**	**Japanese**
Initiating:				
Population	Yes	Yes	Yes	Yes
Technology	Yes	Yes	Yes	Yes
Government Policies	Yes	Yes	Yes	Yes
Business Practices	Severe	Mild	Strong	Mild
Activated:				
Multiplier	Yes	Yes	Yes	Yes
Accelerator	Yes	Yes	Yes	Yes
Accentuating:				
Slow response of Interest Rate	Yes	No	Yes	No
Terminating:				
Diminishing Returns on Investment	Severe	Mild	Strong	Mild
Government Policies	Yes	Yes	Yes	Yes
Countries Classified = 137	63	25	44	5

The classification for Table 2 is as follows: (Foreign investments and overseas export are an inherent part of the classification scheme.)

Socialism State (Government controls all key sectors of the economy including: foreign trade, major industries, production distribution networks, public utilities, banking and credit systems. Direct foreign investment is not welcomed. Light industry and the agricultural sector are often privately owned. Hospitals and health care are usually free of charge and operated by state agencies.

Capitalism Private ownership dominates all key sector of the economy including: all industries, foreign trade, utilities, insurance, banking and agriculture. There is limited government ownership and intervention. Foreign investment is not discouraged. In most cases, fees are charged for health care. Government subsidies are given for those who qualify. Primary, secondary, and higher levels of education are offered at both private and public schools.

Mixed State has nationalized or considerable control on key industries such as: public utilities, petroleum, banking, transportation and major manufacturing. Foreign investment is accepted. There exist many privately owned smaller businesses and light industry. Agriculture and fishing are often operated by private ownership. Health care is free under government sponsorship or subsidies. In some instances, fees are charged.

Japanese Styled This system is characterized by a participatory approach to operating the economic system. All segments of the society are monitored by and supported by government action. The emphasis is on cooperation and not on competitive markets.

The magnitude and duration of a business cycle is dependent upon the structure of the economic system and its operating philosophy. The ability of the system to respond to dynamic changes will determine the severity of the business cycle. For instance, systems which are characterized by labor-management-government confrontation will be less responsive than systems which accentuate cooperation.

Classification of Factors

A broad classification of the more important factors identified as individual causes of business cycle creation is presented below in chronological order.

1. Money Shocks (changes in the volume of money) [Hayek 1932].
2. Deficient Demand [Keynes 1936].
3. Monetary Dislocation [Bresciani-Turonni 1937, chap.V].
4. Uncoordinated Plans [Lange 1938; Hall, 1986].
5. Credit Expansion [Hayek 1939; Hawtrey 1950].
6. Accounting Information [Lacey 1944; Bach 1958; Baxter 1969].
7. Corporate Earnings Retention/Investment [Kalecki 1954].
8. Volatility of Expectations [Kaldor 1960; Lowe 1965; Shackle 1968].
9. Irregularity of Investment [Lowe 1965].
10. Unsystematic Money Shocks [Lucas 1981].
11. Random Technological Shocks [Long and Plosser 1983].
12. Deterministic Chaos [Brock and Sayers 1988].

Of the twelve cycle factors, the *money shocks* (sytematic and unsystematic) would be the least influential in the creation of business cycles. Historically, *money shocks* do not

have the ascribed impact on the economy. Empirical evidence suggests that when money is treated as an exogenous variable by policy, financial innovations are introduced by business firms to restore the endogenous nature of money in the economy [Judd and Scadding 1982, 1001-1005,1013]. Money as a cause of the business cycle is disputed theoretically by, inter alios, Williamson [1987] and on empirical grounds by Friedman [1986, 437,451-455]. The view of *accounting information* as the cause of business cycles places the burden of business cycle creation on financial accounting measurement [Lacey 1944; Bach 1958; Baxter 1969]. The origin of this view seemingly stems from the 1927 articles (Business Cycles--An Accounting Error!) written by an accounting theorist, Fritz Schmidt ("Die Industriekonjunktur--Ein Rechenfehler!" Zeitschrift fuer Betriebswirtschaft, Vol.4, 1927). Domar [1957] has strenuously challenged this view. Yet, this view still persists. It is maintained that healthy financial position provides for an acceleration of investment, and poor financial position provides for accentuated contractions [Bernanke and Gertler 1989].

In a summary review of the theories and empirical works on business cycles, Zarnovitz [1985, 570] maintains that the *Rational Expectations* model is the new fad and not a legitimate contender. It was excluded from the list above because it is only a key assumption of a legitimate contender - *real business cycles (RBC)* [Stadler 1994, 1750-1751]. In the *RBC* model, cycles in exogenous technology disturbances drive cycles in output. However, cyclical activity in output and employment is not a consequence of a purely temporary shock to productivity; only temporary deviations in output and employment away from their long-run paths are the end results of a temporary shock [Stadler 1994, 1769]. *Random technological shocks* [Long and Plosser 1983] is the main framework of the *RBC* model [Stadler 1994, 1752]; it is based on the premise that there are disturbances to a continuous equilibrium setting but full employment equilibrium is restored after the random shocks are experienced. This condition has yet to be observed. To the contrary, in the European Community, the record unemployment levels peaked in 1985 but has not returned to the levels of the 1980s; and it is still far away from the much lower levels of unemployment of the 1970s [Woodford 1994, 1813].

While the *RBC* model has contributed much to the current understanding of macroeconomic phenomena, historical evidence does not support the existence of

continuous equilibrium. Estey [1956, 102] concluded that the conditions of stable equilibrium are violated by business cycle behavior. The available evidence on business cycles reveals a fundamental instability in the economic system. Once the economic system is moved from equilibrium, the forces which are set in motion are not the forces which are inclined to restore equilibrium; instead, the forces which are responsible for disturbing the system's equilibrium cause the system to move farther away from the original equilibrium. The progressive departure of the economic system from equilibrium is halted by the resultant strain on the system; this strain sets up limits that not even the tremendous power of the cumulative forces of expansion or contraction can overcome. Hence, the attribution of the business cycles to *random technological shocks* is untenable.

Deterministic chaos is the latest entry in the literature. The mathematics for this model is similar to the mathematics used for the *RBC* model. The difference lies in the use of a stochastic growth model in *RBC* theory which generates a stochastic process with an infinite dimension, whereas chaos theory (as used in studying business cycles) deals with deterministic processes which appear random but have a finite dimension [7, p.73]. While the *deterministic chaos* approach has produced new statistical and diagnostic methods capable of uncovering empirical regularities which are indiscernible by other methods, little evidence of low-dimensional chaos has been found [Brock and Sayers 1988, 88].

Propagation Mechanisms and Impulses

Pre-Keynesian theories of the business cycles emphasized propagation mechanisms and focused on the internal dynamics of the economic system [Gordon 1986, 5]. Ragnar Frisch [1933] provided a new perspective and made a clear distinction between those factors which are impulses and others (propagation mechanisms) which propagate business cycles. Knut Wicksell (1907) has been credited by Frisch [1933, 198] as being the first scholar to: (1) recognize the two distinct cycle problems: impulse and propagation; and (2) attribute business cycles to erratic shocks to the economic system. Eugen Slutsky (1927) and G. Udny Yule (1927) have been credited by Frisch [1933, 198] as the first scholars to have provided mathematical studies of the mechanism by which an impulse can be propagated to produce a business cycle. Apparently, this distinction is quite important to

the development of a general theory. While the works of Wicksell (1907), Slutsky (1927) and Yule (1927) predates that of Hayek [1932], those works were abstract and did not offer a specific cause or specific causes. The importance of those abstract works were not ignored. Hayek [1932, 140-141] recognized that it is necessary to focus on the propagators, since in their absence there would be no business cycles. Kalecki [1954, 102-105] viewed investment as being conditioned by *corporate earnings retention*; this relationship precludes the automatic response of investment to erratic shocks to the economic system.

In current times, attention has been given to the role of impulses. Eckstein and Sinai [1986, 40-41] have identified five major impulses:

1. A rise in aggregate demand.
2. A decline in aggregate demand.
3. Sudden curtailments of key supplies which affect production.
4. Increases in price due to the removal of price controls.
5. Sharp increases in the interest rates.

Of the five impulses enumerated, the interest rate is considered as the most dominant impulse. Farmer [1984, 921] maintains that the interest rate has a significant influence on business fluctuations. High interest rates cause firms to go into bankruptcy; hence, output is reduced. Akhtar [1983, 319,327] concluded that an increase in interest rates influences inventory adjustments and the impact of inventory adjustment on GNP is quite significant. Ramey [1989, 351] maintains that inventory investment appears to have two roles in the business cycle: (1) an important propagation mechanism and (2) an important source of shocks. However, it would be deficient demand or a significant increase in the interest rate that would produce a shock effect on inventory. Blanchard and Watson [1986, 146] investigated the properties and the roles of shocks in economic fluctuations during the period 1950-1982 and concluded that fiscal, money, demand and supply shocks are accountable for economic fluctuations in roughly equal relative weights.

A PLAUSIBLE GENERAL THEORY

In this section a general theory is advanced for one (a credit-oriented market economy) family of economic systems by focusing on four factors: 1. factors which initiate

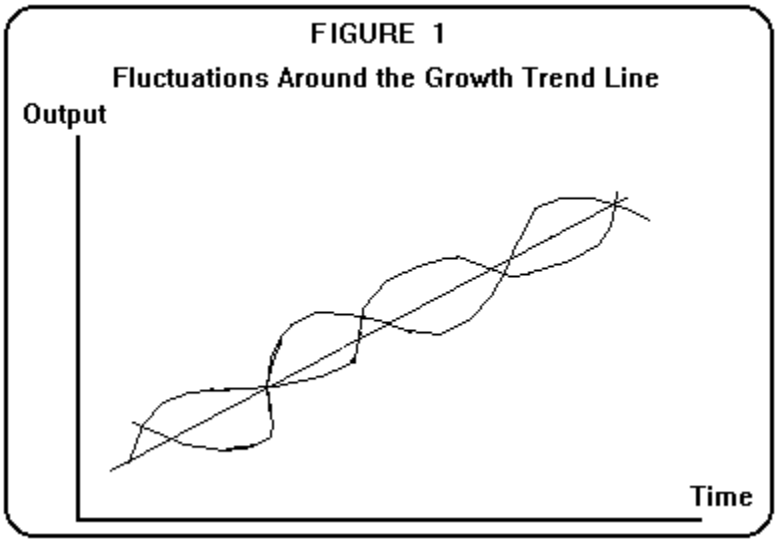
the cycle--exogenous factors (shocks to the systems); 2. factors which are activated by the cycle--endogenous factors (system dynamics); 3. factors which accentuate (aggravate) the cycle--exogenous factors (business and governmental policies); and 4. factors which terminate the cycle--endogenous and exogenous factors (system dynamics and governmental policies).

The general theory is constructed along the lines suggested by Kaldor [1960], Cobeljic' and Stojanovic' [1969], and Harrod [1973]. These authors maintain that: (1) the economic cycle is an inherent part of the growth process, and (2) three factors account for economic growth: (a) savings, (b) population growth, and (c) technological progress. Savings is important, but it is an endogenous variable. The other factors are exogenous variables with a more significant role in producing economic fluctuations. Many individual non-labelled factors jointly may produce an economic cycle. For instance, Japan was a net importer prior to 1970, and the balance of payments exercised a predominant influence upon the growth and production cycles during the postwar period [Shinohara 1969, 77]. However, business cycles caused by the cumulative effect of these combined non-labelled factors would be quite sporadic and relatively small. While evidence supports coexistence of small and large shocks, substantial evidence exists which negates the small-shock hypothesis [Blanchard and Watson 1986, 146].

For most economies, the business cycle would be comprised of: (1) an investment cycle and (2) a consumption cycle. Yet, the growth path of the economy is directed and redirected by exogenous shocks (Sn) to the system (e.g., catastrophes and cartelization). According to Cobeljic' and Stojanovic' [1969, 20 and chap.11], cyclical fluctuations in socialist countries are caused by technological progress. While the investment cycle has an important role in explaining economic fluctuations in socialists economies, the consumption cycle, due to the rationing process, would not have a significant role. However, shocks, such as population growth, do affect the investment cycle.

Hicks [1950], Kalecki [1954, 126], Kaldor [1960, 222], and Harrod [1973] have stressed that there exists a growth trend upon which cycles (fluctuations) are imposed. The trend line reflects the average effect of all prior shocks to the system; this condition holds since the cycles are imposed on the growth trend of the economy. This position is well

accepted [Danthine and Girardin 1989, 6; Zarnowitz 1985, 532]. The growth trend is due to two growth factors: (a) population growth, and (2) technological progress. However, business cycles are caused not by the growth factors themselves, but by shocks to the economic system and the responses of the system to those shocks. Thus, the problem facing economists is to find a procedure to adequately decompose economic data into the growth trend and cyclical components [9]. In Figure 1, each boom represents a movement from one equilibrium seeking level to another higher equilibrium seeking level. Equilibrium is never attained because the system never comes to rest.



In general, there are three factors which account for the magnitude of the amplitude. The *first* factor is the desire for growth at a level which is not sustainable by the technological and institutional setting. From a stock market point of view, this condition may tempt business firms to accelerate sales of a later period into an earlier period to achieve a desired level of growth. The *second* factor is the set of business practices in force (short-term profit maximization - e.g., substitution of machines for labor). According to Nadiri [1970, 1146], "when entrepreneurs anticipate a relative increase in real wages, they will, in the short run, substitute capital for labor (provided that the elasticity of substitution is positive) and then concentrate on innovations which are labor saving." It would seem obvious that in the case of less than 'full employment' in the economy, such a labor-

substitution policy can only lead to more unemployment. Another business practice is "double ordering" to ensure delivery of merchandise on time. This practice can lead to unwarranted expansion of production. The subsequent cancelling of the double order gives rise to an excess inventory accumulation and, hence, a contraction of production [Fortune 1985]. The *third* factor is the structure of the financial system (e.g., the incorporation of banking services by business firms via credit granting ability; the lengthening of the credit repayment period; and corporate earnings retention policies).

The general theory advanced in this study is based on the behavior of business firms and the behavior of consumers. The evidence from these two sources should support the existence of three cycles: (1) an investment cycle, (2) a consumption (durable goods replacement) cycle, and (3) a credit cycle. A similar position on the behavior of consumers is held by Hall [1986, 239,254-255], who concluded that there are shifts in consumption expenditures, and these shifts constitute an important source of overall economic fluctuation. While not advocating a credit cycle, Friedman [1986, 437] maintains that while money is incapable of providing an explanation of economic fluctuations, the credit system can provide a better gauge of business activities and hence of economic fluctuation. The *investment cycle* would be influenced by the decisions of the many firms whose quest for growth activate the "accelerator principle"; the *consumption (durable goods replacement) cycle* increases employment and activates the "multiplier principle". Since consumption is a function of disposable income and consumers' credit position: C = f(DPI, CCP), the *credit cycle* emerges because the system can only accommodate so much growth in a certain period of time. After a certain period of expansion, the consumers' credit position becomes strained - credit is saturated. In earlier periods, a portion of future earnings will be spent and will not be available for future consumption expenditures; thus, future consumption will be less than it could have been.

Sufficient Conditions

The following are sufficient conditions to produce fluctuations around the growth trend in an economy: (1) incomplete information; (2) uncoordinated production plans; (3) unrestrained credit; and (4) uncontrolled expansion.

Incomplete Information. Consumers' actual consumption (Cp) differ from producers' expectation (e.g., Consumers plan X consumption; some producers expect X + α, while others expect X + ζ). It is the lack of complete information (on producers' plans for investment and production, and the availability of money capital), which provides for the *volatility of expectations*. This condition is governed by Harrod's [1973, 33,41] "instability principle" which manifests itself in decentralized decision-making. Goodwin [1989, 157-167] on both theoretical and mathematical grounds has established the validity of Harrod's "instability principle". *Volatility of expectations* (a suggested cause of business cycles creation) is nurtured by uncertainty, lags, and miscalculations [Kaldor 1960, 231; Lowe 1965, 74-75; Shackle 1968, 120-121].

Uncoordinated Production Plans. Producers decide on what amounts (Op) to produce independently of each other, accordingly $\Sigma Op \neq Cp$. When $\Sigma Op > Cp$, the following period would experience contraction. When $\Sigma Op < Cp$, the following period would be characterized by over-expansion. In the presence of coordinated plans and cooperation among the various segments of the economic system, it is possible for the adjustment (to the change dictated by the movement to the new equilibrium level) to be far less severe than in the absence of those conditions. In this situation, the fluctuations around the trend line in Figure 1 would be fairly dampened.

Unrestrained Credit. Customers are granted credit to the very limit of their credit capacities. Their repayments are scheduled for several years into the future. Except for basic consumption goods and services, this condition produces a significant negative impact upon future consumption. It is only when the debts of consumers have been reduced considerably that another wave of frantic expansion can be experienced.

Uncontrolled Expansion. Regardless of its cause, when demand exceeds manufacturers' investment in inventory, price increases result. These increases trigger an upsurge in investment, which do not take into account the excess capacity in existence. Such demand ultimately fades and the end result is over-investment. As the case may be, if there is an interest rate policy associated with rising prices, it would produce a contraction due to a disincentive for investment. In the case of government fiscal policy, a tax credit is

provided as an incentive to manufacturers to invest, but the government policymakers give no consideration to either the ability of individual firms to invest or existing excess capacity. This latter condition gives rise to a situation of chronic excess capacity.

OUTLINE OF A BASIC MODEL OF THE BUSINESS CYCLE

The assumptions underlying the basic model of cycle creation (for one family of economic systems: a credit-oriented market economy) are as follows:

Model Assumptions

1. *Investment* and *production* occur over time.
2. *Money* is an *endogenous* variable in the economic system.
3. The *economic system operates at close to full employment* (as defined by You [1979], frictional unemployment and excess capacity exists).
4. Business firms are *short term profit maximizers*.
5. *Investment decisions* are made in terms of *nominal money*.
6. *New plant* and *equipment* incorporate *new technology* and are more productive than old plant and equipment.
7. The *increase in money prices* of new plant and equipment are considered as the cost of *increased productivity*.
8. *Diminishing returns* are measured in terms of *nominal dollars.*
9. *Credit rationing* and the *calculations for consumers' decisions* are made in *nominal money* terms.
10. *Want satisfaction*, the basis of production, is not a constant physical quantum but a *psychological quantum* which is subject to change without notice.
11. *Sociological changes* are shocks to the system.
12. *Population growth* produces an increase in the demand for goods and services.
13. *Unbridled technological progress* displaces labor, thus shrinking the demand for goods and services.

Resulting Conditions: System Dynamics

1. Wage rates rise as a result of assumptions 3 and 12.
2. Prices rise given assumption 12 and in response to condition 1.
3. Products that were marginally profitable are no longer profitable because of an increase in production cost.
4. New investments in plant and equipment are undertaken, and new labor-saving technology is adopted.
5. The intensity in the demand for money and the demand for credit (given 2 and 4), causes interest rates to rise.

Propagation Mechanisms: Business Practices

1. Retailers maintain sales level (given system dynamics #5) by eliminating down payments and extending the payment period.
2. Practice 1 aggravates the inflationary pressure; demand does not slacken and prices continue to rise.
3. Producers continue investing in plant and equipment and increase their output.
4. Central banks act to control inflation by raising the bank interest rates significantly.

Terminating Factors: Diminishing Returns

1. The significant increase in the cost of financing production render some former profitable producers no longer profitable. In fact, some of them go out of business.
2. Now, unemployment creeps into the picture as layoffs occur due to factor 1.
3. Demand slackens due to factor 2.
4. Producers now have involuntary investments in inventories.

DESCRIPTIVE ANALYSIS

The limited statistical data presented in the following tables merely serve to intimate at the plausibility of the theory as advanced. Further research is needed to firmly establish the validity of the theory.

The Investment Cycle

There is a time lag (a gestation period) for investment. This time lag in part explains the tendency of investment to overshoot the equilibrium level and introduces a certain automaticity of the business cycle into the economic system [Hamberg 1951, 363; Kalecki 1954, 128-131]. Furthermore, the lumpy nature of investment causes an irregularity of investments, which accounts for economic fluctuations. This condition holds for capitalist economies; however, it is also witnessed in the Japanese economy [Shinohara 1969, 79]. Assuming that the firms making up the economic system are efficient and would take their existing plant capacities into account when making investment decisions, the common sentiment is that the marginal efficiency of capital ensures that the right amount of investment would take place. However, in reality many firms despite high internal rates of return, owing to their size (small and medium) are not able to expand. This condition has a stabilizing effect; it reduces the full potential of over-investment, but at the expense of efficient resource allocation.

The following equations set out some basic relationships predicated on the "marginal efficiency of capital":

(1.0) $I = f(D,i,Ku)$
(I = Investment; D = Demand: i = Cost of credit; Ku = Plant Capacity Utilization)

(2.0) $i = g(S)$ (S = Demand for Available Savings)

(3.0) $S = h(Al)$ (Al = Asset levels - Plant size, receivables and inventory levels)

Data presented in Table 3 suggest that the "marginal efficiency of capital" is violated. The low MCUs for 1975 (72%) and 1982 (70%) coincide with two cycle troughs. Although there was a cycle trough in 1980, the peak to trough was relatively short; it covered a period of only 6 months. Table 3 reveals that despite the increase in physical output (MPI), a case of chronic excess capacity exists. In spite of the existing excess capacity, investment in plant and equipment was undertaken each and every year.

TABLE 3

Manufacturing Capacity Utilization (MCU), Manufacturing Production Index (MPI), Business Capital Expenditures (BCE), and Capital Consumption Allowances (CCA)

	MCU	MPI (1977=100)	BCE (Current $ Billion)		CCA ($Billion)
Year	%	%	Total	Mfg	Total
1970	79	77	91.9	37.0	57.2
1975	72	83	142.4	53.7	90.2
1980	79	100	282.8	112.3	164.6
1981	78	111	315.2	126.5	196.3
1982	70	102	310.6	120.7	225.5
1983	74	110	304.8	116.2	259.7
1984	81	123	354.4	138.8	287.2
1985	80	126	387.1	153.5	328.3
1986	80	129	379.5	142.7	336.6
1987	81	135	388.6	145.5	349.2
1988	84	142	455.2	163.5	365.0
1989	84	146	507.4	183.8	351.7
1990	82	147	532.6	192.6	319.0
1991	78	144	530.0	184.3	307.1

Source for 1970-1987: 49, pp.533,537,730. Source for 1988-1991: 48, pp.538,542,745.

It can be argued that the investments are being made by the efficient firms, while the excess capacity resides with the inefficient firms. This argument requires an empirical answer. Nevertheless, if the right business mergers occur, then the economic system will receive a shock. Some of the excess capacity will be absorbed, and there will be a curtailment in investment. Data on merger activities [US Department of Commerce 1992, 534] reveal that in 1980 there were 1,558 mergers, and for the period 1983-1990, the number of mergers respectively were: 2,395; 3,176; 3,489; 4,463; 4,024; 4,233; 4167; and 4,168. However, there were increases in plant capacity utilization only in 1988 and 1989. Evidently, the mergers did not produce the attainable efficiency in the economic system.

Since inventory is very costly to hold (given costs such as insurance, storage, etc.), questions are raised by the magnitudes of the ratios of inventory to sales in Table 4. Is the inventory a shield against possible strikes or anticipation of future shortages? Is the over-investment in inventory held only by inefficient firms?

TABLE 4
Sales and Inventories for Manufacturing and Trade, and Annual Average Prime Interest Rate
(Current $ Billion)

Annual Year	Sales Monthly Average	Inventory End of Year Book Value	Ratio of Average End of Month Inventory to Average Monthly Sales	Average Prime Interest Rate%
1975	182	289	1.52	7.86
1978	261	400	1.44	9.06
1979	298	451	1.44	12.67
1980	328	494	1.41	15.27
1981	357	528	1.52	18.87
1982	349	582	1.67	14.86
1983	369	574	1.56	10.79
1984	409	620	1.52	12.04
1985	419	645	1.54	9.93
1986	425	657	1.55	8.33
1987	453	710	1.57	8.20
1988	496	740	1.49	9.32
1989	526	797	1.52	10.87
1990	543	819	1.51	10.01
1991	535	815	1.52	8.46

Source for 1970-1987: 49, pp.503,535. Source for 1988-1991: 48, pp.507,540.

Here again, mergers can produce a shock to the system through the reduction of production to work out the excess investment in inventory. However, owing to the fact that some mergers are induced by the monetary returns obtainable from the dismantling of the acquired firms, mergers do not have to result in the streamlining of the economic system. The evidence in Table 4 reveal that, except for 1980, 1984 and 1988 in which there were significant downward shifts in the ratio of inventory to sales, there is very little streamlining of the investment in inventory. This condition may be due, in part, to the lowering of interest rates.

The Consumption (Durable Goods Replacement) Cycle

Ratios of durable goods to consumption expenditures is presented in Table 5. On a priori grounds owing to the long duration in the usage of durable goods, one would expect consumers to replace their durable goods in an irregular pattern. Their replacement pattern would depend on their needs, preferences and credit position.

TABLE 5

Personal Consumption Expenditures (CE) and Consumer Durable Goods Expenditures (DGE) (Current $ Billions)

	CE		DGE		Ratio %
Year	Amount	Index	Amount	Index	DGE/CE
1980	1,732.6	100	219.3	100	12.6
1981	1,915.1	110	239.9	109	12.5
1982	2,050.7	118	252.7	115	12.3
1983	2,234.5	129	289.1	132	12.9
1984	2,430.5	140	335.5	153	13.8
1985	2,629.0	152	372.2	170	14.2
1986	2,807.5	162	406.5	185	14.5
1987	3,012.1	174	421.9	192	14.0
1988	3,296.1	190	437.1	199	13.3
1989	3,517.9	203	459.8	209	13.1
1990	3,742.6	216	465.9	212	12.4
1991	3,889.1	224	445.2	203	11.4

Source for 1970-1987: 49, p. 421. Source for 1988-1991: 48, p. 428.

As revealed in Table 5, the ratio (DGE/CE) declined in 1982 and again in 1987, at which time it continued through 1991. These changes in the ratio suggest the existence of a durable goods replacement cycle.

The Credit Cycle

In the U.S., during the period 1975-1982, repayment schedules on new car loans and mobile home loans were for a period of 36 months and for 84 months, respectively. In 1983, these repayment schedules were for 48 months and 120 months [US Department of Commerce 1989, 500]. Table 6 reveals the significant impact of this change in repayment schedules. CICP as a percentage of DPI rose steadily from 15.2% in 1983 to 19.1% in 1987. There are two credit saturation periods: 1982 and 1990-91. These two credit saturations have produced the 1980-1982 business cycle in the US economy and the recession which began in July 1990 and has continued through 1993.

TABLE 6

Consumption Expenditures(CE), Disposable Personal Income(DPI) and Consumer Installment Credit Position(CICP) (Current $ Billions)

	CE		DPI		CICP1		CICP/
Year	Amount	Index	Amount	Index	Amount	Index	DPI-%
1980	1,732.6	100	1,918.0	100	297.6	100	15.5
1981	1,915.1	110	*2,061.0	107	310.7	104	15.1
1982	2,050.7	118	2,261.4	118	323.5	109	14.3
1983	2,234.5	129	2,428.1	127	367.9	124	15.2
1984	2,430.5	140	2,668.6	139	442.5	149	16.6
1985	2,629.0	152	2,838.7	148	517.8	174	18.2
1986	2,807.5	162	3,019.6	157	571.8	192	18.9
1987	3,012.1	174	3,209.7	167	613.0	206	19.1
1988	3,296.1	190	3,548.2	185	664.0	223	18.7
1989	3,517.9	203	3,788.6	197	718.9	241	19.0
1990	3,742.6	216	4,058.8	212	735.1	247	18.1
1991	3,889.1	224	4,209.6	219	729.4	245	17.3

1 Balance outstanding on instalment credit at end of year. * Estimated to conform to this series.
GNPIPD 1980-1987 (1982=100): 85.7, 94.0, 100.0, 103.9, 107.7, 110.9, 113.9, 117.7 (respectively).

Source : 1970-1987 - 49, pp. 421,424, 499. 1988-1991 - 48, pp. 428,434, 504. 1991 DPI - 47, p.445.

Table 7 provides some insight into the marginal propensity to consume which is influenced by the consumers' credit position. Marginal consumption (δCE) is negatively related to marginal income (δDPI) and positively related to marginal credit (δCICP).

$$(4) \qquad \delta CE = \alpha - \beta 1 \delta DPI + \beta 2 \delta CICP$$

This condition obtains because marginal income is already hypothecated for consumption enjoyed in earlier periods; therefore, marginal consumption must be financed by credit. As revealed in Table 7, a credit cycle ended in 1982. Subsequently (1983-1989), an upsurge in spending occurs concurrent with increases in instalment credit. However, in 1986, there was a slight dip in marginal consumption. The spending spree ends in 1990, which is the end of another credit cycle. Additional DPI is needed for the repayment of credit in 1991.

Table 7

Annual Changes in Expenditures, Income and Credit Position
1980 through 1987
(Current $ Billions)

Period	CE	DPI	CICP
1981-80	182	143	13
1982-81	135	200	13
1983-82	184	167	44
1984-83	196	240	74
1985-84	198	170	75
1986-85	179	181	54
1987-86	204	190	41
1988-87	284	338	51
1989-88	222	240	55
1990-89	225	270	16
1991-90	146	151	- 6

Source: Derived from Table 6.

EVALUATION OF THE CLASSIFIED BUSINESS CYCLE CREATION FACTORS

In this section of the paper, the identified business cycle factors are categorized and briefly argued to be either disqualified or qualifying cycle creation factors. The basis for

their classification is an evaluation in terms of their effect upon the economic system. All theories discussed in this study have contributed in one fashion or another to a better understanding of business cycles. Thus, the classification of a factor as disqualified is not intended to diminish the importance of the contribution of that particular line of reasoning.

Disqualified Factors

Monetary dislocation is disqualified as a cycle creation factor because it is a highly irregular occurrence; as such it would be an irregular fluctuation which would have to be adjusted for to determine the magnitude of the business cycle. *Money shocks* (changes in the volume of money) and *unsystematic money shocks* are disqualified because money is an endogenous variable in the economic system, and there is empirical evidence which supports this position. *Financial accounting information* is not a cycle creation factor for it is an observational report which simply provides for a description of the state of affairs. How this state of affairs was brought about is of concern to interested parties. Furthermore, decisions to invest are based upon ex ante projections of profits, and not on ex post measures of past profits. *Corporate earnings retention* would aggravate the cycle situation owing to the misalignment of financial capital and investment opportunities, but it is not a shock to the system.

Qualifying Factors

Deficient demand is a shock to the system. *Credit expansion*, whether it is solely within the jurisdiction of the central bank or subject to the policies of business firms, it is a shock. *Irregularity of investment* is a cycle factor which is inherent in the economic system. *Volatility of expectations* is a cycle factor due to the lack of complete information. *Uncoordinated production plans* would constitute a cycle factor because of adjustment shocks due to overestimation and underestimation of other producers' output plans. *Volatility of expectations* combined with *uncoordinated production plans* would engender uncontrolled expansion. *Technological shocks* resulting from the substitution of labor with labor displacing technology is a major factor affecting disposable income and, hence, contributes to *deficient demand*. *While technology contributes to progress, if it remains unbridled,* it will be the most crippling of all cycle creation factors in the future.

CONCLUSION

The various theories of business cycles creation presented in this historical setting offer contributions to the total development of a general theory. The theoretical analysis does suggest that any of the various factors alluded to individually would be sufficient under certain rare circumstances to induce a business cycle. Invariably, no individual factor would be sufficiently strong to produce a cycle without the aid of a few of the other identified factors. Accordingly, single factor theories can quite safely be considered as special cases of the general theory as expounded in this paper.

This paper has advanced a general theory for one family of economic systems--a credit-oriented market economy. Although the empirical observations in the study are limited, the statistical data presented in this analysis do suggest that the theory as developed is plausible. However, longer time series data for the US and other similar economies would have to be subjected within this study's framework to sophisticated statistical testing so that this plausible theory may be validated or refuted.

Future research should focus on: (1) identifying countries which constitute other families of economic systems; (2) discerning the factors which are influential in promoting business cycles in those respective families of economic systems; and (3) developing general theories related to those specific families of economic systems. Once generalizations have been made about those families, common and uncommon characteristics of all identified families of economic systems should be catalogued.

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